

APPENDIX A

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www.asce.org American Society of Civil Engineers

www.ascelasection.org ASCE Los Angeles Section

www.ccgo.org California Council for Geotechnical Organizations

www.aegweb.org Association of Engineering Geologists

www.geosociety.org Geological Society of America

<http://rock.geosociety.org/egd/index.html> Engineering Geology Division

www.coastgeologicalsociety.org Coast Geological Society

www.southcoastgeo.org South Coast Geological Society

<http://info.er.usgs.gov> United States Geological Survey- Information

<http://ilrg.gndci.pg.cnr.it> International Landslide Research Group

www.dca.ca.gov/geology California Board of Registration for Geologists and Geophysicists

www.dca.ca.gov/pels California Board of Registration for Professional Engineers and Land Surveyors

<http://dpw.co.la.ca.us/ldd/dmg117slope.pdf> LA County Public Works Draft DMG 117 for Earthquake Induced Landslides

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www.scec.org Southern California Earthquake Center

www.seismic.ca.gov Seismic Safety Commission

<http://nss.calstatela.edu/geology> California State University, Los Angeles Geology Department

www.ess.ucla.edu UCLA Earth and Space Sciences Department

www.geosun.sjsu.edu/NAGT/fws_home.html National Association of Geoscience Teachers- Far West Section

www.uwm.edu/~vcronin/mcfz.base.html Dr. Cronin Malibu Coast Fault Zone Website

<http://dibblee.geol.ucsb.edu> Dibblee Foundation

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http://ceres.ca.gov/cra/ocean/coastal_erosion_draft.html Resources Agency of California – Draft Guidelines for coastal erosion mitigation

www.icbo.org International Conference of Building Officials

www.cbc.org California Building Code

www.bingyen.com Bing Yen & Associates, Inc., Camarillo and Irvine offices, California

APPENDIX B

Soil Corrosivity

The following comments are taken, with some minor editing, from the Los Angeles County Manual for Preparation of Geotechnical Reports.

Soil corrosivity is influenced by the sulfate and chloride content of the soil or water and by the pH and resistivity of the soil. Soil corrosivity is often beyond the expertise of geotechnical engineers. Professionals that specialize in this subject are available and should be consulted. Nevertheless, the Geotechnical Consultant can provide a preliminary evaluation of potential concerns by testing the soil for sulfate and chloride content and for pH and resistivity. In evaluating potential soil chemistry effects on building sites, the Consultant shall use a qualified laboratory to conduct the testing and provide a copy of the laboratory data sheet.

The test should be evaluated in light of the test method and compared with industry thresholds for chemical attack or corrosion.

The Geotechnical Consultant can, based on their experience and judgment, evaluate potential chemical and electro-chemical hazards in lieu of, and/or in addition to, those cited here. The Consultant may elect to use one of the representative test methods cited in these guidelines or another method of the Consultant's choosing, or recommend that an expert in soil corrosivity be retained to further evaluate site conditions.

If field resistivity tests are preformed, the Consultant shall report the following:

- Map showing array locations.
- Data sheet showing measured resistance.
- Table or Figure showing computed results.

Sulfides –Sulfates

Sulfides minerals are usually encountered in unweathered bedrock. When exposed to air and moisture, sulfides undergo a chemical reaction to become sulfates, which can lead to other problems as described below. During this chemical reaction the sulfide minerals may expand as much as eight times. Often this reaction is described as being soil expansion. The standard expansive soil test, however, will not detect this potential chemical reaction. Presently, little is known about the chemical reaction rate. In some areas, the chemical reaction is very rapid occurring within a few days after exposure. In other areas, this reaction is very slow affecting structures years after construction. Sulfide minerals have been encountered in the Castaic Formation in the Santa Monica Mountains, from Topanga to Encino. Certain sulfate minerals present in the soil, rock mass, or groundwater have a detrimental effect on concrete. Most prominent of these are sulfates of sodium, magnesium, and calcium. These sulfates react chemically with the hydrated lime and calcium aluminate of the hardened cement paste to form calcium sulfo-aluminate.

Disintegration of the concrete is due to a combination of chemical and physical forces. The effect of such an attack is minor in dense impermeable concrete on relatively dry natural materials, but will result in disintegration of high water-cement ratio, permeable concrete bearing on saturated highly mineralized fill, or natural materials.

Based on CBC requirements, when soluble sulfate concentrations are greater than 1,000 ppm in soil and 150 ppm in groundwater, mitigation measures must be taken to protect any concrete structures in contact with the soils. If soil is not to be removed, appropriate cement type must be used. The soils engineering report must considered tests for sulfide-sulfate minerals in the soil, rock mass, and/or groundwater. Recommendations in the soils engineering report must include mitigation measures such as either the removal of the sulfide and sulfate materials to a depth below the concrete that the sulfates will not influence the proposed structure, treatment to remove the sulfates and/or design of foundations to resist the effect of the sulfates.

Chlorides

Large concentrations of chlorides will adversely affect ferrous materials, such as, iron and steel. When chloride concentrations exceeds 18,000 parts per million, mitigation measures must be taken to protect any steel reinforcing within concrete and any steel pipe or cast iron that serve the development (LA County, 2001). Mitigation measures generally consist of cathodic protection, isolation such as utilizing very dense cement mixes around vulnerable material, or plastic wrap to prevent moisture contact between the soil and the material under protection.

pH

Mitigation must be recommended when test results indicate that the on-site soils are corrosive. Typically, acidity will not cause trouble until the pH gets down around 4.0 (LA County, 2001).

Resistivity

The most common factor in determining soil corrosivity is electrical resistivity. As a soil's resistivity decreases, its corrosivity increases. Mitigation must be recommended when test results indicate the soil to be moderately corrosive or worse per the following table:

Soil Resistivity, Ohm-Cm	Corrosivity Category
0 – 1,000	Severely Corrosive
1,000 – 2000	Corrosive
2,000 – 10,000	Moderately Corrosive
over 10,000	Mildly Corrosive

PLATE A

Planning Stage Review Process Flow Chart

Geology and Geotechnical Engineering Planning Stage Review

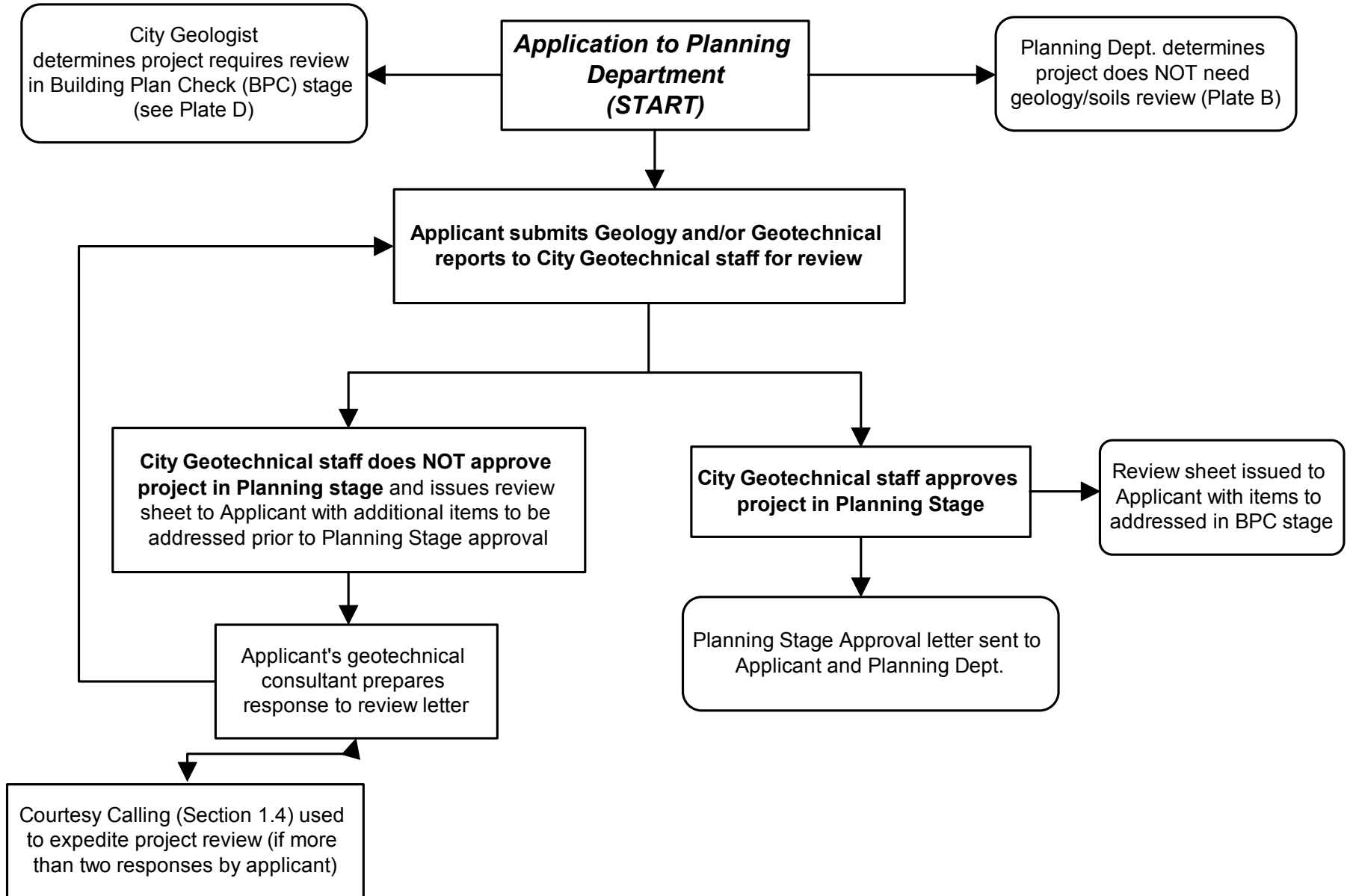


Plate A

PLATE B

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(310) 456-CITY Fax (310) 456-3356

Geology and Geotechnical Engineering Staff

CITY OF MALIBU PROJECT REVIEW/PLANNING DEPARTMENT FROM CITY GEOTECHNICAL STAFF

Revised November, 2001

This list is intended as a guideline for the City of Malibu Planning and Building and Safety Departments to utilize at the counter to determine the level of Engineering Geologic/Geotechnical Engineering review of projects submitted to the City.

Projects that do not require Geology/Geotechnical Review in the Planning Stage: These projects do not have to be referred to City geotechnical staff via a geology referral sheet.

- Interior remodels with no new foundations (excluding Big Rock, La Costa, Las Flores Mesa/Eagle Pass, Malibu Road, and other landslide-prone areas-these may require some level of review if the septic system is enlarged)
- Bay windows-architect/engineer to utilize minimum Code values for foundation design
- Tenant improvements with no new foundations
- Hardscaping (not requiring a grading permit)
- Landscaping (not requiring a grading permit)
- Retaining walls less than three feet in height with no structural surcharge (parking area, slope, or building)
- BBQ pits (not requiring a grading permit)
- Detached, non-habitable structures (UBC definition) less than 400 square feet and 12 feet in height-architect/engineer to utilize expansive soil design (currently we require soils reports in BPC stage for detached structures that are 400 square feet)
- Screened in porches/patios-UBC definition
- Trellises on flat building pads away from slopes
- Privacy walls/wood and chain link fences, non-retaining
- Satellite dishes
- Antennas (no new foundations and retaining walls)
- Solar panels
- Wooden Decks on flat building pads
- Tennis courts not requiring grading

- Temporary erosion control plans
- Re-roofing
- Portable (above ground) and in-ground spas not adjacent to slopes and/or geologic/geotechnical hazards
- Water fountains, waterscapes, ponds, less than 24-inches deep (do not need building permit)

Projects that require Geology/Geotechnical Review in the Planning Stage-Please present a Geology Referral Sheet and 2 sets of plans to the applicant to present to City geotechnical staff over the counter on Mondays or Thursdays, 8:30 AM-12:30 PM

- Commercial buildings
- Multi-family residences
- Single family residences
- Mobile homes/manufactured homes
- Commercial coaches
- Guest houses/studios
- Swimming pools
- Remedial grading projects
- Sites that require a grading permit (over 50 cubic yards, or overexcavation deeper than 3 feet)
- Room additions to existing residences and commercial buildings*
- Detached, non-habitable structures (UBC definition) greater than 400 square feet
- Retaining walls with greater than 3 feet of retained soil or surcharged (from parking area, structure, or slope)
- Wooden and concrete decks on slopes
- Private sewage treatment systems
- Slope stabilization and/or dewatering systems
- Subdivisions and lot line adjustments (case-by-case basis)
- Tentative Tract Maps
- Tennis courts that require grading, retaining walls

* City geotechnical staff to review addition projects over the counter via geology referral sheets. Level of review will be based on size of addition and whether the addition encroaches toward a slope or geologic/geotechnical hazard

PLATE C

Geology Review Referral Sheet



City of Malibu

23555 Civic Center Way, Malibu, California 90265
(310) 456-CITY Fax (310) 456-3356

GEOLOGY REVIEW REFERRAL SHEET

TO: City of Malibu City Geologist
FROM: City of Malibu Planning Department

PROJECT NUMBER: _____ DATE: _____
JOB ADDRESS: _____
APPLICANT / CONTACT: _____
APPLICANT ADDRESS: _____
APPLICANT PHONE #: _____
APPLICANT FAX #: _____
PROJECT DESCRIPTION: _____

TO: Malibu Planning Department and/or Applicant
FROM: Mr. Chris Dean, City Geologist

_____ The project is geologically feasible and CAN proceed through the planning process.

_____ Geologic feasibility of the project CANNOT be determined until the City Geologist conducts a preliminary review to observe site conditions and evaluate potential geologic hazards. The City Geologist will bill the applicant at an hourly rate of \$96.⁵⁰, with a one hour minimum.

_____ The project CANNOT proceed through the planning process until geological feasibility is determined. Depending upon the nature of the project, this may require geology and/or geo-technical engineering (soils) reports which evaluate the site conditions, factor of safety, and potential geologic hazards. The following items are required to begin the review process:

- ☐ Geology Report & Geology Review Deposit (\$625)
- ☐ Geo-technical Engineering (Soils) Report & Geo-technical Engineering Review Deposit (\$625)

SIGNATURE _____ DATE _____

Determination of geologic feasibility for planning should not be construed as approval of building and/or grading plans which need to be submitted for Building Department approval. At that time, those plans may require approval of both the City Geologist and Geo-technical Engineer. Additional requirements/conditions may be imposed at the time building and/or grading plans are submitted for review, including requiring geology and geo-technical reports.

Mr. Chris Dean, City Geologist, may be contacted at the Building & Safety Counter Mondays and Thursdays between 8:30 AM and 12:30 PM or by calling (310) 456-2489, extension 306.

PLATE D

Building/Grading Plan Check Stage Review Process Flow Chart

Geology and Geotechnical Engineering Building/Grading Plan Check Stage Review

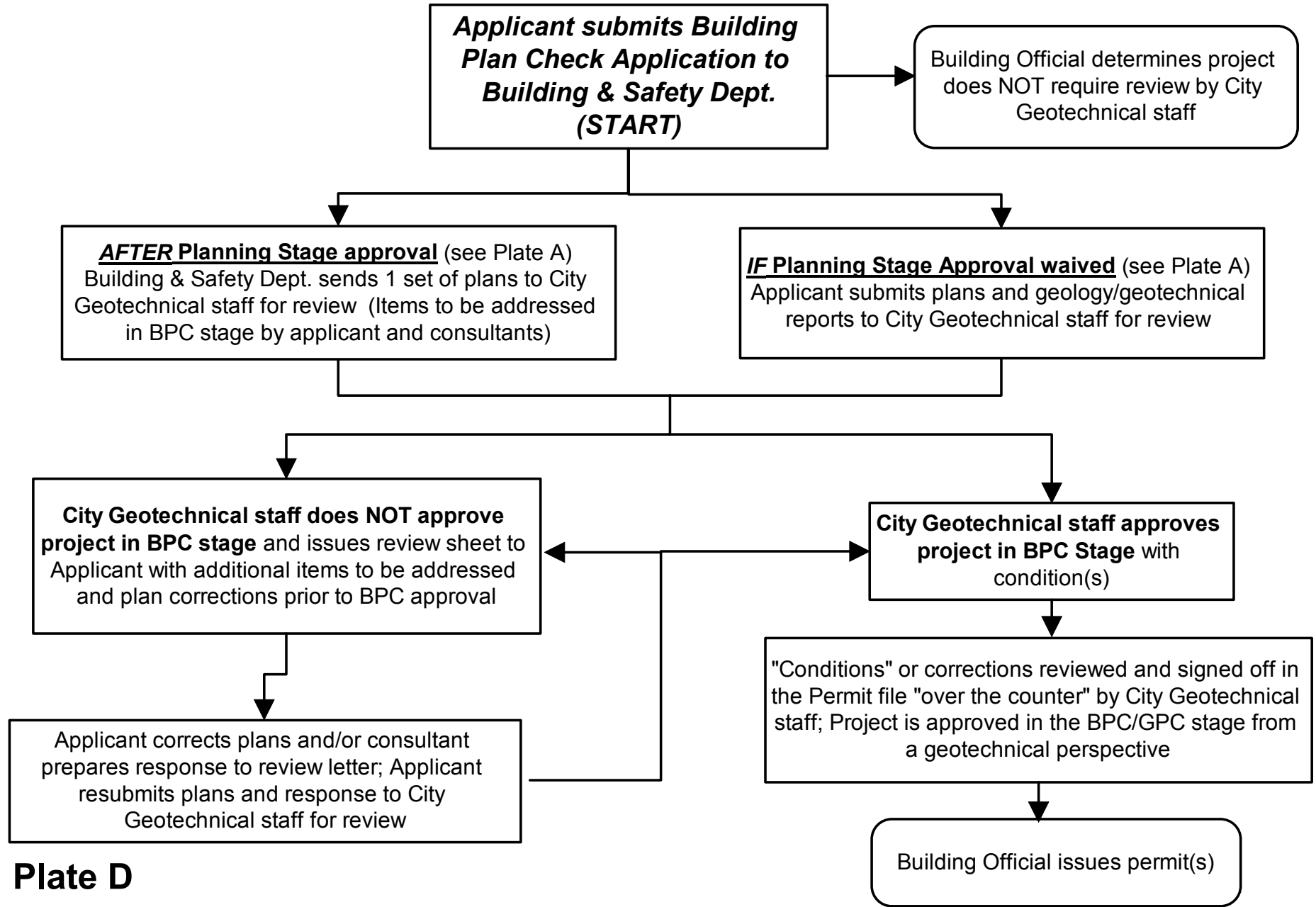


Plate D

PLATE E

Refund Request Form



City of Malibu

23555 Civic Center Way • Malibu, California • 90265-4804
(310) 456-2489 • fax (310) 456-3356

REFUND REQUEST

MAIL CHECK TO: _____

REASON FOR REFUND:

REQUESTED BY: _____

ADDRESS: _____

TELEPHONE: _____

AMOUNT OF REFUND: \$ _____

APPROVED BY: _____

DATE: _____

PLATE F

Pool/Spa Submittal Requirements



City of Malibu

23555 Civic Center Way • Malibu, California • 90265-4804
(310) 456-2489 • fax (310) 456-7650
Victor M. Peterson, Building Official

POOL/ SPA SUBMITTAL REQUIREMENTS

Dear Applicant:

The City of Malibu has some unique conditions that require complete, detailed pool/spa plans to be provided to insure that code conforming pool/spa construction can occur. In addition to the building code requirements, all pool/spa plans require planning review and approval.

In order to effectively and efficiently process and plan check your pool and/or spa plans we are asking that you provide, at the time of initial building plan check application, the attached information. This complete information will also produce a plan that can be used effectively by the contractor and building inspector in the field.

It would be very helpful if you would take a few minutes to review the submittal requirements and insure that the information is on the original plans and that the submittal documents are complete. You may want to consider this as a preliminary plan check that you can do yourself to insure a complete application. Incomplete applications are subject to return to the applicant, which, in turn, will cause a time delay.

I am confident that this information will help in our understanding and processing of the plans and, therefore, obtaining a permit as soon as possible. If you have any questions or ideas to make this process even better, please do not hesitate to let me know. Thank you for playing a part in the timely processing of your project

Victor Peterson, Building Official

Date

Note: All Swimming pools and spas, defined as any body of water over 24" in depth, shall meet the following submittal requirements.

GEOLOGY AND GEOTECHNICAL ENGINEERING

Provide current, applicable soils and geology reports that address the construction of a pool and/or spa at the project site. The type of report required will depend on the location of the planned pool/spa. In general, if the pool or spa is located in a geologically stable, flat area, a minimal foundation investigation for the proposed pool/spa will be required. If, however, the pool or spa is located in a hillside area, a more comprehensive Geotechnical engineering and geology report that evaluates slope stability, as well as the pool will be required. To obtain more information and/or to verify what type of report is required, the project can be discussed with any member of the geology/Geotechnical engineering staff during public counter hours on Mondays and Thursdays or by calling (310) 456-2489 extension 306. Major requirements for the two different types of reports are contained below.

Foundation Investigation:

- Applicable and adequate subsurface information
- Expansive soil details and recommendations
- Bearing materials
- Pool wall design pressure
- Retaining wall design pressures

Geology and Geotechnical Engineering Report:

- Applicable and adequate subsurface information
- Analysis of slope stability in accordance with the City's guidelines for Geotechnical reports
- Recommendations for the most appropriate foundation system and specific Geotechnical foundation recommendations
- Expansive soil details
- Pool wall design pressure
- Retaining wall design pressure
- Sub-drain and sub-drain outlet recommendations and details

STRUCTURAL CALCULATION/ STANDARD PLANS

"Standard Plans" by themselves are generally not applicable in Malibu because of the geography and soils/geological conditions. Additionally, our experience is that standard plans are not being maintained to current code by the various jurisdictions providing the standardization. However, they may be used (and revised with calculations as necessary) in conjunction with other engineered plans. If "Standard Plans" are used, the following must be provided:

- Wet stamp and wet signature of the engineer
- Indicate or highlight the specific applicable details and delete those that do not apply

Structural calculations and details shall be provided for all conditions not covered by the "Standard Plan". *Note: Soils and/ or geologic conditions may govern*

Provide a design and indicate the pool walls that are to be "free standing". These walls are considered structural concrete and "special inspection" is required for the shotcrete/ gunite process per UBC Section 1922. Note this requirement on the plans. Concrete cover for reinforcement for free standing walls shall be 3" (Section 1907.7) and it may be reduced to 2" for other conditions per Section 1922.4.

Decks, other structures and retaining walls also require calculations and details.

The site plan, structural plans and calculations must be stamped and signed.

SITE PLAN

This plan is critical for providing sufficient information to allow for efficient plan checking and inspection. The following information can be provided on the site plan or on supplementary sheets. The plan should be drawn to scale with all necessary dimensions. Planning approval is required for all construction.

Show all existing and proposed conditions (and indicate which they are) including:

- Retaining walls (separate permit may be required). Note that planning restricts retaining walls to a maximum height of 6 feet.
- Show retaining wall heights (top of wall elevation) and adjacent grade elevations.
- Elevations, grades, slopes and grading (separate permit may be required)
- Drainage devices
- Decks, stairs, other structures, both existing and proposed.
- Location of on-site wastewater treatment system

Drainage Plan:

- Show existing and proposed grades, elevations, etc.
- Detail site drainage devices
- Locate the point of discharge and detail a dissipater to eliminate erosion

Setbacks:

- Provide dimensions to structures including buildings, retaining walls and slopes

Sections:

- Provide a minimum of two sections (longitudinal and transverse) through the pool to show:
 - Shallow and deep end
 - Relationship of spa/Jacuzzi if applicable
- Provide a minimum of one (more may be necessary) to show:
 - Existing and proposed conditions
 - Retaining walls
 - Required slope setback (slope setback per UBC Appendix Section 3314)

Mechanical Equipment Location:

Show the equipment a minimum of 2'6" from the PL.

Security Fencing:

Locate the fencing and show, detail and/ or note the complete requirements for security fencing (applicable to any body of water over 24" in depth). This requirement is the same as used by Los Angeles County and is attached for your information.

California Energy Requirements:

Provide a note describing the energy requirements for pools and spas on the plan.

Pool Discharge:

A “Pool Drainage Certification Form” which indicates the disposition of pool water, must be completed and signed prior to permit issuance.

DEFINITION

The definition of a swimming pool per UBC Appendix Section 420:

“Swimming pool is any structure intended for swimming or recreational bathing that contains water over 24” deep. This includes in-ground, aboveground, and on-ground swimming pools; hot tubs; portable and non-portable spas; and fixed-in-place wading pools.”

PLATE G

Geologic/Geotechnical Exploratory Excavation Permit



City of Malibu

23555 Civic Center Way • Malibu, California • 90265-4804
(310) 456-2489 • fax (310) 456-7650
Victor M. Peterson, Building Official

GEOLOGIC/ GEOTECHNICAL EXPLORATORY EXCAVATION PERMIT

Site: _____

Date(s) of Exploration: _____

Engineering Geologist/ Geotechnical Engineer: _____

Phone #: _____ FAX#: _____

Client: _____

Description of proposed exploration program and method: _____

Please provide an 8 1/2" x 11" topographic map indicating proposed exploratory site.

SIGNED: _____

City Geologist or City Geotechnical Engineer

Date Permit Received _____ **Date Permit Returned** _____

Note: All individuals, including the consultant(s), must follow Cal OSHA regulations with regard to exploratory excavations. All explorations must be covered, preferably backfilled, according to Cal OSHA regulations. The City holds property owners responsible for exploratory excavations conducted on their property. It should be noted that this permit is not intended to be in lieu of any other required agency permits (i.e., California Coastal Commission, Regional Water Quality Control Board, Underground Service Alert, etc.)

UNDERGROUND SERVICE ALERT # _____ **Valid until :** _____

PLATE H

City of Malibu Alternative Expansive Soils Design-Foundations



City of Malibu

23555 Civic Center Way • Malibu, California • 90265-4804
(310) 456-2489 • fax (310) 456-7650
Victor M. Peterson, Building Official

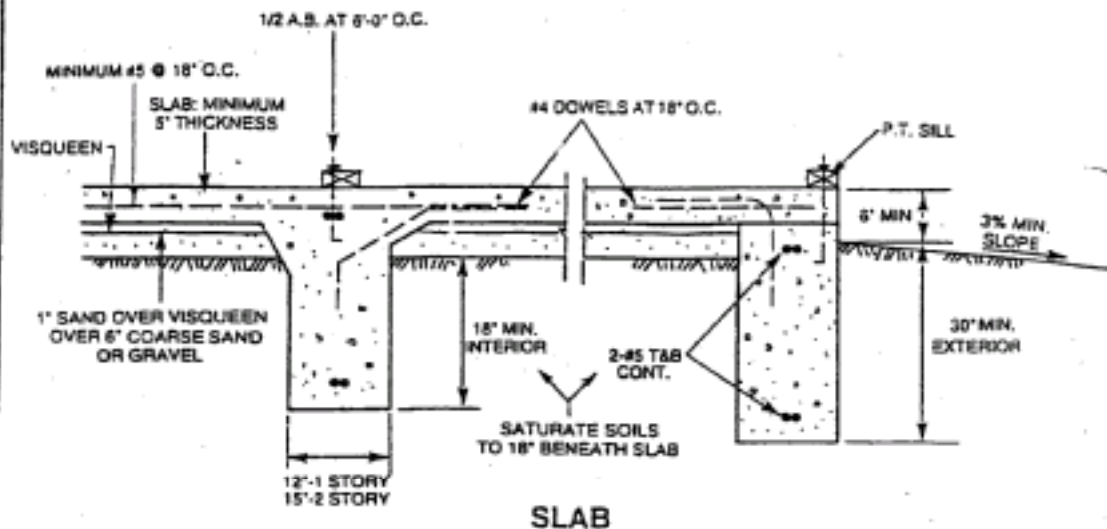
FOUNDATIONS **ALTERNATIVE EXPANSIVE SOIL DESIGN**

1. All facilities shall be designed for highly expansive soils conditions unless an accepted soils engineering review determines that soils conditions on the building site are of lesser expansive potential.
2. All facilities shall be founded entirely on either bedrock or firm natural soils. Proposals to found facilities on fill will require soils engineering review.
3. Minimum 3% positive drainage away from foundations for a minimum distance of 5 feet shall be established and maintained.
4. All roofs should be guttered and the run-off conducted to a drainage system or natural drainage course in non-erosive devices.
5. Foundation planting should be limited to plants native to the area that require a minimum of hand watering. Planters adjacent to the foundation shall have waterproof sides and bottoms and shall have a drainage system to conduct the water away from the foundation. A French drain system adjacent to the foundation is highly recommended. Trees shall not be planted closer than 15 feet from the foundation.
6. Saturate soils under slabs to a depth of 18" before placing concrete.
7. All foundations shall be continuous. Dowel new footings to old. Dowel across cold joints. Dowel slabs to foundations. Maintain continuity of grade beam at garage door and crawl holes.
8. The building code should be consulted for regulations governing all other aspects of construction.
9. All foundations should bear in like materials.

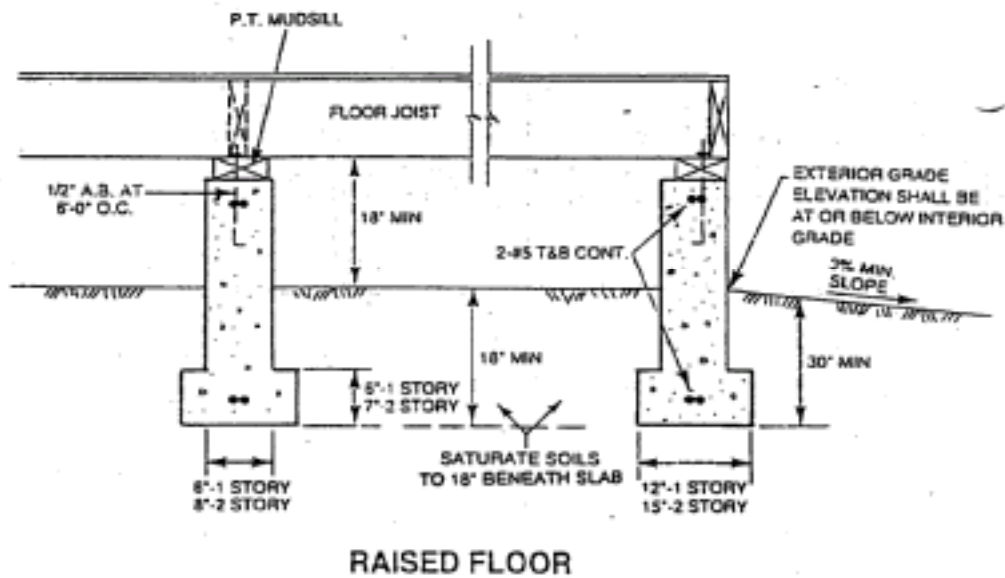
NOTE: It should be noted that utilization of the City's minimum expansive soil design may result in minor expansive soil related movements to the structure due to lot specific circumstances that could only be identified in a soils report. Extreme care should be undertaken when using brittle floor coverings (i.e., marble, limestone, etc.) with slab-on-grade construction.

Building Official

Date



Note: Extreme care should be undertaken when using brittle floor coverings (i.e., marble, limestone, etc.) with slab on grade construction



NOT TO SCALE

FOUNDATIONS

ALTERNATIVE EXPANSIVE SOIL DESIGN